Claim 4, line 2, following "rotating" insert --a plurality of--.

Cancel claim 5.

Claim 6, line 2, change "5" to --1--;

line 4, change "gate" to --gates-- and delete "plates" and following "to" insert --a--;

line 5, delete the first appearing "the" and change "plate" to --said gate--;

line 6, change "plate" to --gate--.

REMARKS

Responsive to the Examiner's Action of December 11, 1998, Applicant has amended the specifications, and claims in accordance with the Examiner's Action. The drawings are being amended in accordance with the attached copies showing the changes in red.

The principal reference to Okumura et al. shows a heating and extruding method for a bulk preform of a fiber reinforced composite material which combines a stabbing machine for forming a hole in the bulk preform and a heating machine connected to the stabbing machine for heating the bulk preform by a nitrogen gas and an extruding machine connected to the heating machine for heating and compressing the bulk preform heated by the heating machine to discharge a predetermined amount of the bulk preform. An extruding lip of the extruding machine has a thickness restriction plate and

a width restriction plate for respectfully adjusting an extrusion thickness and an extrusion width of the melted composite material. The Okumura patent only shows a single adjustable device for adjusting plastic thickness. This design could not allow gates to be side-by-side to allow for a gas web thickness control. The patent does not indicate how the plastic form gets to the mold. This is important to be able to make the thickness change in the plastic lay-down. The molten state of the plastic will inherently return the plastic to a flat sheet.

In the present invention, a control speed and position accurate carriage carries the mold under the extrusion die. As the mold travels under the die, the choreography of die gate changes, carriage speed changes, and extruder speed adjustments are completed by the system controller to position the desired thickness control and lays it into the mold as desired. This limits the natural flow of the resin resulting in a greater control of the thickness. Okumura on the other hand does not provide a plurality of adjustable die gate plates placed adjacent to each other and separately adjustable nor does it adjust the thermoplastic extrusion die plurality of adjustable die gates for varying the thickness of the extruded material passing thereto in different parts of the extruded slab to thereby vary the thickness across the thermoplastic material being extruded, as set forth in claim 1 as amended.

The Murayama et al. patent is for a rotational plastic compression molding apparatus which includes a plurality if

circumferentially spaced female molds and a plurality of circumferentially spaced male molds cooperating respectively with the plurality of female molds. The female molds and the male molds are rotated in synchronism and moved around successive material loading zones, compression molding zones, and an article discharge zones. This patent only teaches a way to position the molds for compression after loading the mold. Neither the Okumura nor the Murayama patents teach use of a moveable carriage or use of multiple gates.

The Knopf patent is an extrusion die employing proximity sensors to directly measure the actual die gap during extrusion and uses manual and automatic closed-loop methods of operation. Knopf provides a plurality of inner flow surfaces in opposed relationship to each other to define a die gap and means for adjustment of the relationship of the inner flow surfaces to each other for controlling minor changes in an extrusion die to produce an even flow of material out of the extrusion die.

This contrasts with the present invention which uses a plurality of die gates to produce an uneven flow of material and to make large changes in flow up to and including complete shut-down of the material from the die at any one or more gates to allow for a non-rectangular lay-down pattern to be built. Knopf uses a molded plastic introduced into a die through an inlet (20) by a pump and is extruded in sheet-like or film form through a die gap created by a pair of die lips (13A) and (13B). Adjustment bolts

(10) control the die gap by pulling the flexible die lip (13A) away from or towards the rigid die lip (13B) by adjustment of bolts 10.

Knopf provides a method of controlling the melt thickness distribution which has a flexible die lip for extruding a plastic melt through an adjustable extrusion by flexing the die lip at one point. Knopf also measures the die gap when the plastic is flowing through the die with a proximity sensor for making adjustments for maintaining the plastic passing through the gap uniform. The Reilly patent teaches an apparatus for producing multiaxially containers and does not deal with thermoforming. The varying wall thickness device uses a needle structure inside a closed mold much like the mechanism that occur in injection molding.

Applicant believes that these prior references do not teach the invention as set forth in claim 1 having a plurality of adjustable die gates placed adjacent to each other which are separately adjustable by adjusting the adjacent plurality of adjustable die gates to vary the thickness of the extruded material passing thereto. It would also be unobvious to combine the Okumura et al., Murayama et al., and Knopf patents without a complete redesign of the machines, which redesign would be unobvious to a person of ordinary skill. There would be no way to modify the Okumura et al. patent to add a plurality of side-by-side separately adjustable gates to vary the thickness of the extrusion with a gas web thickness control. That is, the present invention provides for multiple side-by-side full closing die gates that allow production of a non-rectangular lay-down pattern which needs no

preforms. The resins are in-line blended to negate the need for an inert atmosphere, as set forth in the Okumura et al. patent. The moving carriage also carries a mold under die and gravity, causing the material to flow into the mold stress-free with the precisely set amount of material in the proper place for thickness control in the molded object.

Reconsideration and allowance of the present application are respectfully submitted,

Respectfully submitted,

William M. Hobby, III
Registration #24,167

157 E. New England Avenue
Suite 375
Winter Park, Florida 32789
(407) 644-8888

Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on 2/25/99.

By:William M. Hobby III, Reg. #24,167

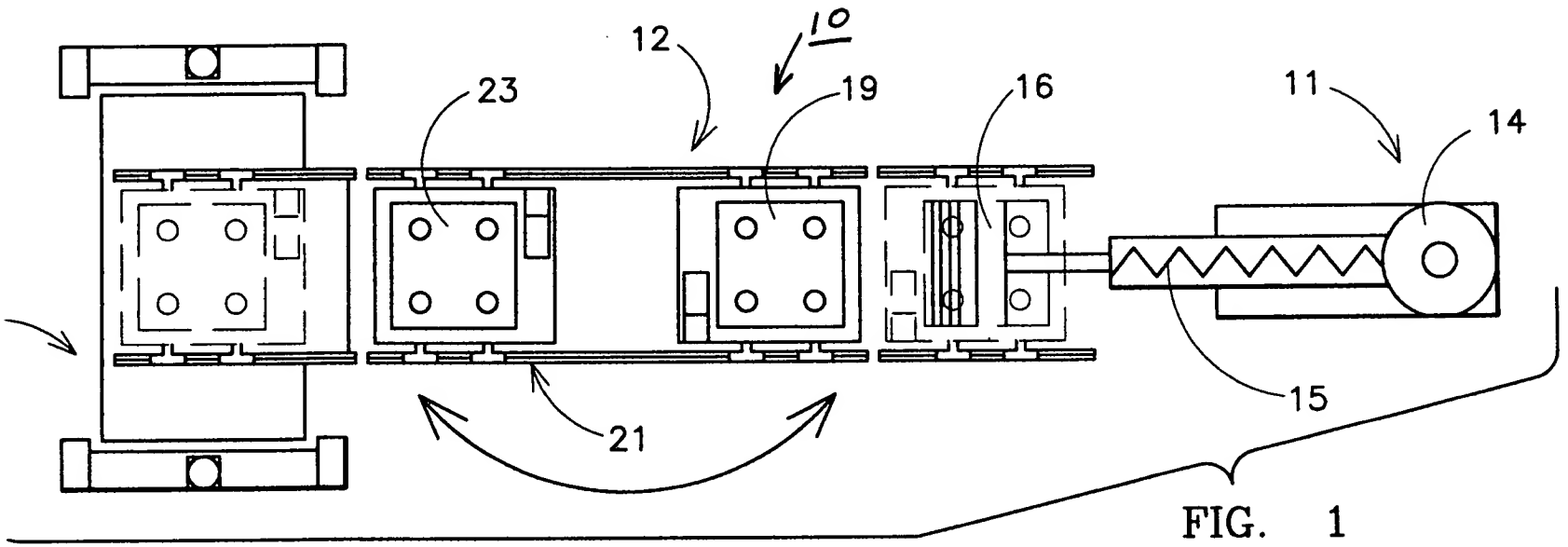
12
10
23
19
16
11
14
15
21

FIG. 1

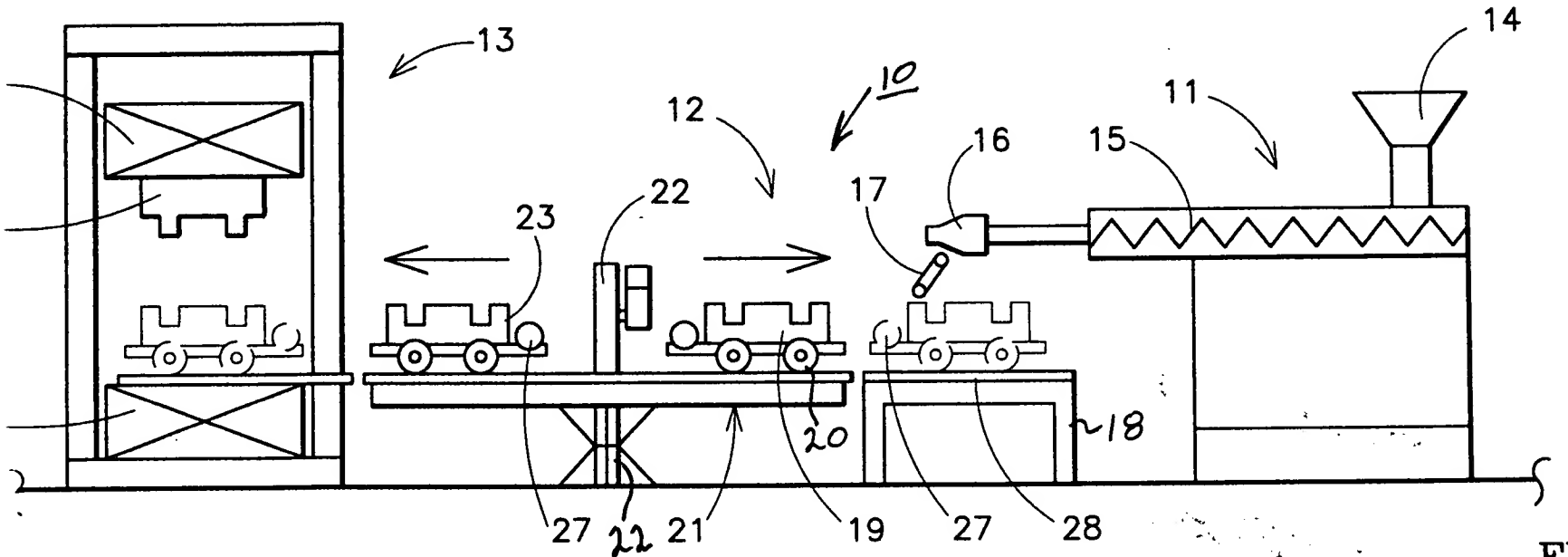
13
14
10
12
11
16
15
17
22
23
18
20
27
22
21
19
27
28

FIG. 2

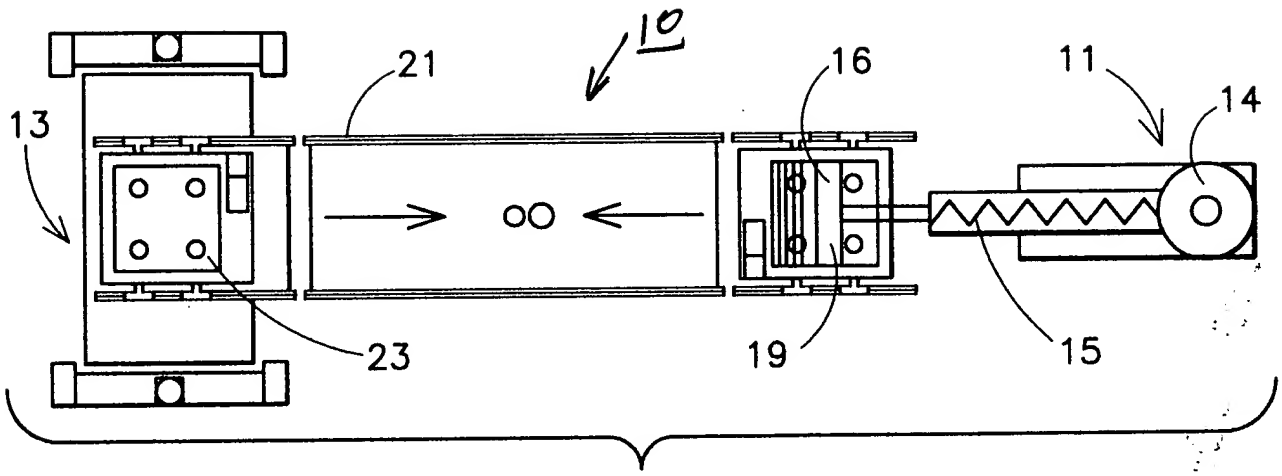

FIG. 3A

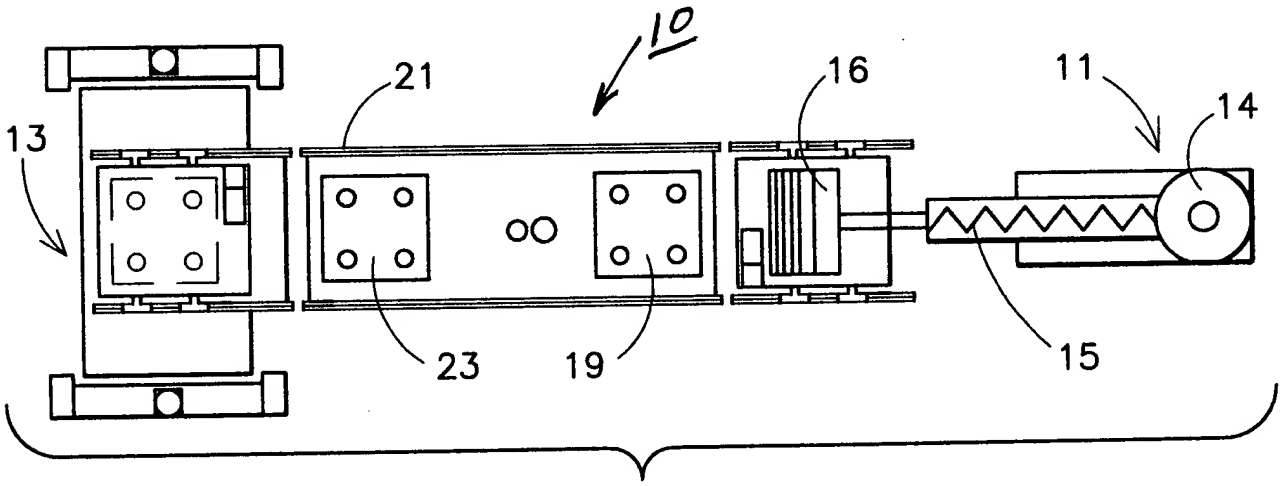

FIG. 3B

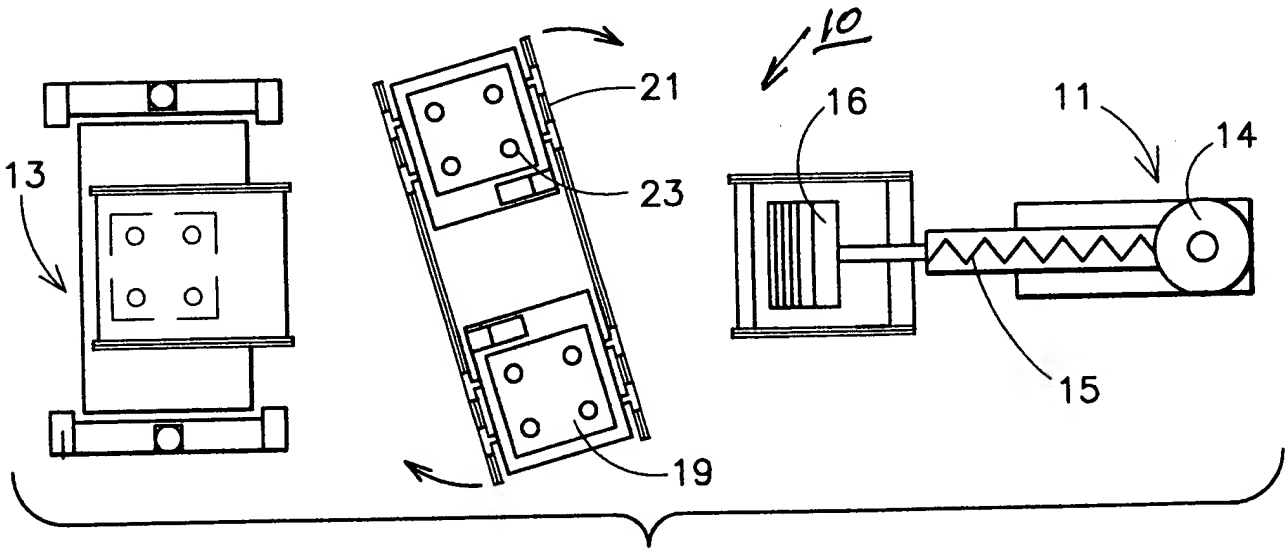

FIG. 3C

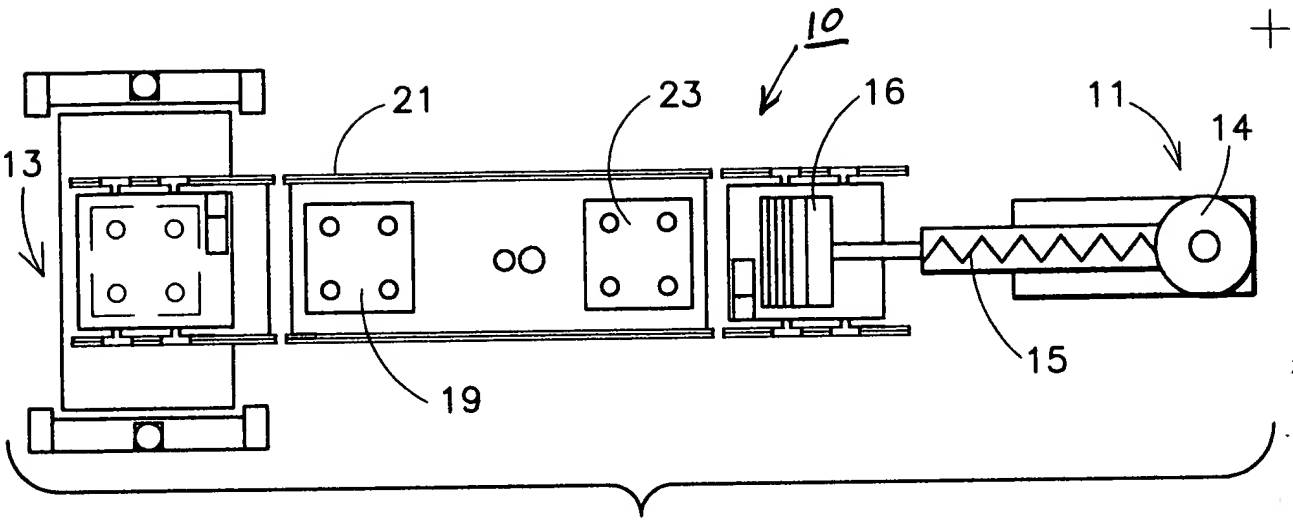

FIG. 3D

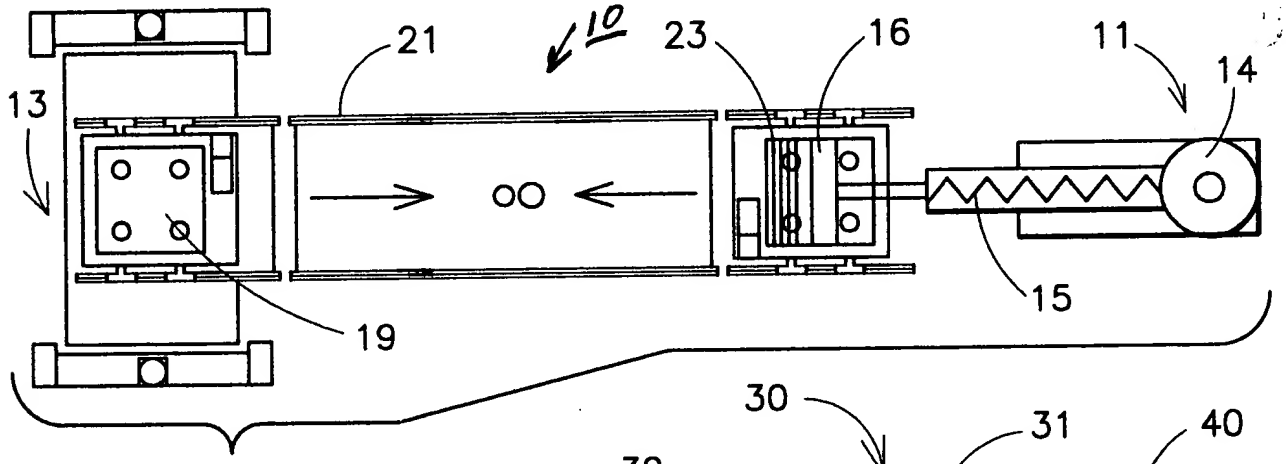

FIG. 3E

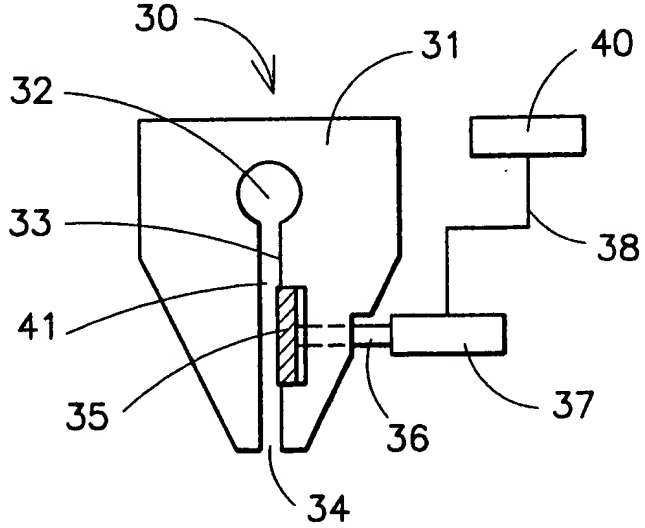

FIG. 4